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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,644	12/09/2004	Chikafumi Yokoyama	57964US004	3064
32692 7590 05/30/2007 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER DANIELS, MATTHEW J	
			ART UNIT 1732	PAPER NUMBER
			NOTIFICATION DATE 05/30/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/517,644	Applicant(s) YOKOYAMA ET AL.	
	Examiner Matthew J. Daniels	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 7-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/15/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Please note that this application has been transferred to Matthew J. Daniels.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 March 2007 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 7-10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. **As to Claim 7**, the limitations now drawn to first and second "cured" materials are indefinite because cured materials existing as solids (not liquids) would have an infinite or nearly infinite viscosity. See page 6, lines 14-19 of the specification for disclosure that the first material "does not easily undergo deformation" after curing. Thus, while the material may have been made of curable materials having viscosities within the claimed range, it would not have the claimed viscosities when used as a mold for a curable precursor of another material which fills

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the groove pattern (because it would mix with the casting composition). Claims 8-10 are rejected by dependence on the base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Rejections set forth previously are withdrawn. The following rejections more accurately address the claimed invention.

5. **Claims 7-10 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama (USPN 6306948). **As to Claim 7**, Yokoyama teaches a method of manufacturing a microstructure having a projection pattern having a predetermined shape and a predetermined size on a surface of a substrate (Figs. 2A-2E), comprising the steps of:

Providing a flexible mold (6:65, Fig. 2B, item 30) having a groove pattern having a shape and size corresponding to those of a projection pattern on a surface thereof (Figs. 2A-2E), and including a cured material (6:54-64);

Arranging a curable rib precursor material between the substrate and the mold and filling the molding material into the groove pattern of the mold (Fig. 2B, 2C);

Curing the molding material and forming a microstructure having the substrate and projection pattern integrally to the substrate (Fig. 2C); and

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Releasing the microstructure from the mold (Fig. 2D).

Yokoyama does not specifically teach the cured first and second materials. However, the Examiner's position is that Yokoyama provides a mold having the same or substantially the same mold structure as claimed, and therefore reads on the claimed method. In the method of Yokoyama the mold is formed by polymerizing a photocurable acrylic monomer or oligomer (6:54-56) having sufficient flexibility to allow removal of the mold from the cured rib material (6:65-67). The claimed mold of this application is formed from two materials, but the first curable material (specification, page 6, lines 20-29) and second curable material (page 7, lines 6-14) are disclosed to be comprised of acrylic or acrylate oligomers or monomers, also providing a "Flexible Mold" (instant title). Thus, in the claimed method, by providing a mold formed from two curable acrylic or acrylate oligomers or monomers, the structure of the cured mold would be that of an acrylic or acrylate polymer, which is the same or substantially the same as that of Yokoyama. **As to Claims 8-10**, Yokoyama teaches a molding material that is photocurable (7:9-10), which can be used as a back plate for a plasma display panel (6:49-52, 8:3), and having a set of address electrodes arranged independently (8:16-20) between the ribs, which would be in parallel since the ribs are arranged in a spaced apart or parallel arrangement (Fig. 2A-2E). **As to Claim 19**, the flexible mold of Yokoyama has the claimed suitability (8:1-36).

6. **Claims 7-10 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka (USPN 5992320) in view of Yokoyama (USPN 6306948) and Kinzer (USPN 5453450). **As to Claim 7**, Kosaka teaches providing a mold having a groove pattern having a shape and size corresponding to a projection pattern on a surface thereof, and including a base layer of a

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first cured material and a second cured material disposed on the surface of the base layer (25:58-61, 26:47, and Figs. 18(a)-(e)).

Kosaka does not specifically teach (a) a first curable material having a viscosity of 3,000 to 100,000 centipoise, (b) a second curable material having a viscosity of less than 200 centipoise, or (c) the steps of arranging, curing, and releasing.

However, these aspects of the invention would have been prima facie obvious for the following reasons:

(a) Kosaka suggests that the adhesive should be a photocurable adhesive (26:46-47) comprising thermoplastics or reactive monomers (20:60-65) such as acrylates (9:3-17), but Kosaka is silent to the claimed viscosity. However, Kinzer teaches that it is known to provide epoxy-acrylate compositions (1:5-10) which are particularly suitable for bonding substrates such as plastics (1:9-10) by polymerizing to a viscosity of 4000 or 20,000 centipoise because this viscosity provides a syrup that is more suitable as a coating composition (10:45-59).

(b) Kosaka suggests that the second material (described as the ink) is in a liquid state (26:34) or a slurried state (16:31-32), and because liquids such as water have viscosity levels of about 1 centipoise, the liquid ink of Kosaka would have implicitly had the claimed viscosity (below 200 centipoise).

(c) Yokoyama teaches a method of manufacturing a microstructure having a projection pattern having a predetermined shape and a predetermined size on a surface of a substrate (Figs. 2A-2E), comprising the steps of: Providing a flexible mold (6:65, Fig. 2B, item 30) having a groove pattern having a shape and size corresponding to those of a projection pattern on a surface thereof (Figs. 2A-2E), and including a cured material (6:54-64); Arranging a curable rib

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precursor material between the substrate and the mold and filling the molding material into the groove pattern of the mold (Fig. 2B, 2C); Curing the molding material and forming a microstructure having the substrate and projection pattern integrally to the substrate (Fig. 2C); and Releasing the microstructure from the mold (Fig. 2D).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Kinzer and Yokoyama into that of Kosaka because (a)(i) Kosaka suggests photopolymerizable adhesives, which Kinzer provides (26:47), (a)(ii) Kosaka requires a coated adhesive on a plastic substrate (Fig. 18(c), items 14 and 21), and Kinzer teaches that it is desirable to provide a viscosity of 4000 or 20,000 centipoise because this makes a syrup more suitable for coating, as required by Kosaka, or (a)(iii) Kinzer suggests the material for adhesive use in consumer appliance industries (1:13-14), which Kosaka provides, and (b) Yokoyama suggests that molds formed from acrylic monomers or oligomers (6:56) have flexibility sufficient to allow removal of cast or cured components (6:65-67) for repeated use without washing (7:1-8) and are therefore useful for casting and curing components, and Kosaka's mold is formed from acrylic monomers or oligomers (Cols. 7-8), and therefore would have been desirable as a casting mold as suggested by Yokoyama.

As to Claim 8, Kosaka teaches various photocurable materials (Cols. 7-8). **As to Claims 9 and 10**, Yokoyama teaches that photocured molds are useful for casting articles which can be used as a back plate for a plasma display panel (6:49-52, 8:3), and having a set of address electrodes arranged independently (8:16-20) between the ribs, which would be in parallel since the ribs are arranged in a spaced apart or parallel arrangement (Fig. 2A-2E). **As to Claim 19**, the mold of Kosaka has the claimed suitability.

7. **Claims 11-18 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka (USPN 5992320) in view of Kinzer (USPN 5453450). **As to Claim 11**, Kosaka teaches a method of making a mold that would inherently be flexible comprising:

Coating a first curable material on a support film (Fig. 18(c), items 14 and 21, also 26:46-47);

Coating a second curable material on a master mold filling recesses of the mold (Fig. 18(b), items 13 and 60, also 26:31-35);

Laminating the coated support to the coated mold such that the first curable material is between the second curable material and the support film (Fig. 18(c));

Heat or photocuring the two curable materials (Fig. 18(c), above item 22, also 8:30, 7:10-17); and

Releasing the flexible mold from the master mold (Fig. 18(d)).

Kosaka does not specifically teach (a) a first curable material having a viscosity of 3,000 to 100,000 centipoise or (b) a second curable material having a viscosity of less than 200 centipoise. However, these aspects of the invention would have been prima facie obvious for the following reasons:

(a) Kosaka suggests that the adhesive should be a photocurable adhesive (26:46-47) comprising thermoplastics or reactive monomers (20:60-65) such as acrylates (9:3-17), but Kosaka is silent to the claimed viscosity. However, Kinzer teaches that it is known to provide epoxy-acrylate compositions (1:5-10) which are particularly suitable for bonding substrates such as plastics (1:9-

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10) by polymerizing to a viscosity of 4000 or 20,000 centipoise because this viscosity provides a syrup that is more suitable as a coating composition (10:45-59).

(b) Kosaka suggests that the second material (described as the ink) is in a liquid state (26:34) or a slurried state (16:31-32), and because liquids such as water have viscosity levels of about 1 centipoise, the liquid ink of Kosaka would have implicitly had the claimed viscosity (below 200 centipoise).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kinzer into that of Kosaka because (a) Kosaka suggests photopolymerizable adhesives, which Kinzer provides (26:47), or (b) Kosaka requires a coated adhesive on a plastic substrate (Fig. 18(c), items 14 and 21), and Kinzer teaches that it is desirable to provide a viscosity of 4000 or 20,000 centipoise because this makes a syrup more suitable for coating, as required by Kosaka, or (c) Kinzer suggests the material for adhesive use in consumer appliance industries (1:13-14), which Kosaka provides.

As to Claims 12, 14, and 16, both first and second materials (ink and adhesive) of Kosaka are photocurable (26:30-47). **As to Claim 13**, Kinzer teaches a partially polymerized photopolymerizable epoxy-acrylate (10:45-49, 1:1-10) which would have been desirable in the combination in view of Kosaka's suggestion to use a photopolymerizable adhesive (26:47). **As to Claim 15**, acrylate monomers, such as those taught by Kosaka (7:40-64) are acrylic acid esters. **As to Claims 17 and 18**, the support film of Kosaka can transmit irradiated light for photocuring through the support film (12:25-45 and Fig. 18(c)). **As to Claim 20**, Kosaka teaches ink (rib precursor) which contains glass (23:63-67), ceramic powder (glass is ceramic, 23:63-67), and a binder (23:65-67).

Response to Arguments

8. Applicant's arguments filed 15 March 2007 have been fully considered but they are not persuasive or are moot in view the new grounds of rejection set forth above. The arguments appear to be on the grounds that neither Yokoyama nor Audsley teach a flexible mold prepared from two curable compositions having different viscosities.

9. With regard to the argument that neither reference teaches a flexible mold prepared from two curable compositions having different viscosities, it is noted that Claim 7 now requires two cured compositions. The characteristic or property of solution viscosity is lost upon curing (polymerization or hardening), and therefore would be insufficient to distinguish the claimed invention from those now cited.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Matthew J. Daniels', with a stylized flourish at the end.

Matthew J. Daniels

A.U. 1732

21 May 2007